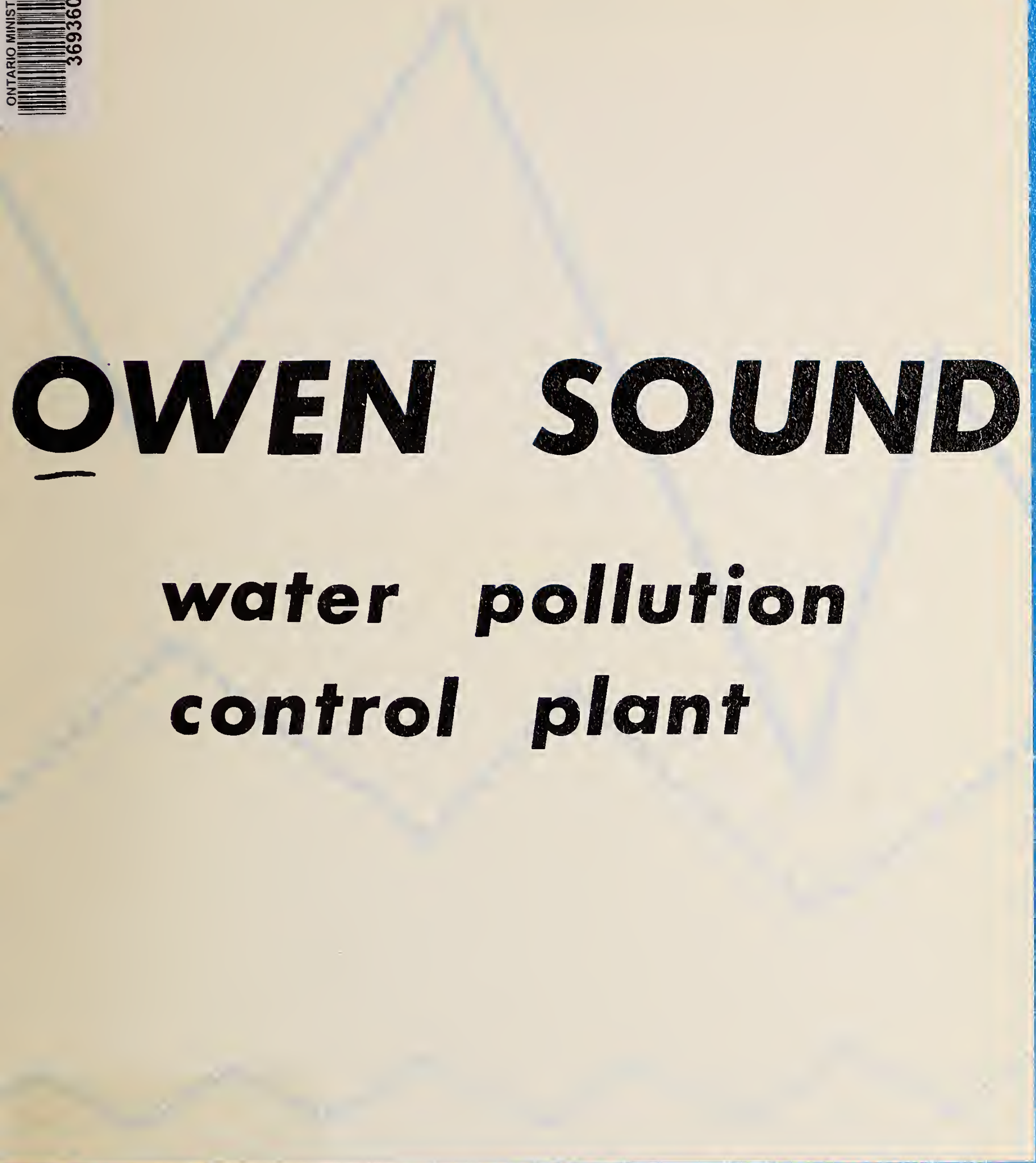
ONTARIO MINISTRY OF ENVIRONMENT
36936000024497

OPERATING SUMMARY



OWEN SOUND

water pollution control plant

1967

TD
367
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1967
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
367
.A56
O94
1967

Owen Sound : water pollution
control plant.

81781

ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Owen Sound Local Advisory Committee,
City of Owen Sound.

Gentlemen:

We are happy to present you with the 1967 Operating Summary for the Owen Sound Water Pollution Control Plant, OWRC Project No. 2-0068-60.

Your co-operation with our staff throughout the year has been appreciated. Only with such co-operation can the war against water pollution be waged effectively.

Yours very truly,

D Caverly

D. S. Caverly,
General Manager.

LIBRARY COPY
JAN 20 1969
ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET
TORONTO 5

J. A. VANCE, LL.D.
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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER
W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Owen Sound Water Pollution Control Plant, OWRC Project No. 2-0068-60.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

DMcTavish

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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FOREWORD

- This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

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OWEN SOUND

water pollution control plant

operated for

THE CITY OF OWEN SOUND

by the

ONTARIO WATER RESOURCES COMMISSION

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Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: A. Clark

801 Bay Street Toronto 5

'67 REVIEW

The total flow to the plant in 1967 was 1415. 50 mg, or an average daily flow of 3. 88 mg. This represents an increase of approximately 0. 7 mgd over 1966 and is in excess of the design capacity of 3. 0 mgd. The average BOD strength of the raw sewage rose to 148 ppm while the average suspended solids concentration rose to an extremely high level of 388 ppm. There are indications that the high suspended solids concentration was caused by a grit-like industrial waste.

The cost of operation was $48, 655.69 or $34. 37 per million gallons.

During the latter part of 1967 the secondary digester was removed from service to allow for the removal of accumulated solids.

Chlorination was carried out on a year-round basis.

During 1967 the plant staff consisted of a chief operator, two operators, and a labourer. Operation was supervised eight hours a day, seven days a week. An alarm system was installed between the West Side sewage pumping station, the plant and the operators' homes to indicate a high wet well level at this station.

The unsatisfactory functioning of the storm water relief system of the West Side interceptor sewer resulted in storm flows being conveyed to the West Side sewage pumping station. A portable Diesel pump was installed at this station to provide temporary storm relief until a more permanent solution could be investigated.

PROJECT COSTS

NET CAPITAL COST (Estimated)		$1,467,321.96
DEDUCT - Payments from Municipalities	$ 30,758.65	
- Portion Financed by CMHC (Estimated)	996,392.74	1,027,151.39
Long Term Debt to OWRC		$ 440,170.57
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967		$ 53,401.62

Net Operating	$ 8,883.00
Reserve	8,796.41
Interest Charged	24,822.72
Net Operating	48,655.69
TOTAL	$ 91,157.82

RESERVE ACCOUNT

Balance at January 1, 1967	$ 42,497.31
Deposited by Municipality	8,796.41
Interest Earned	2,600.71
	$ 53,894.43
Less Expenditures	(1,040.00)
Balance at December 31, 1967	$ 52,854.43

MONTHLY OPERATING COSTS

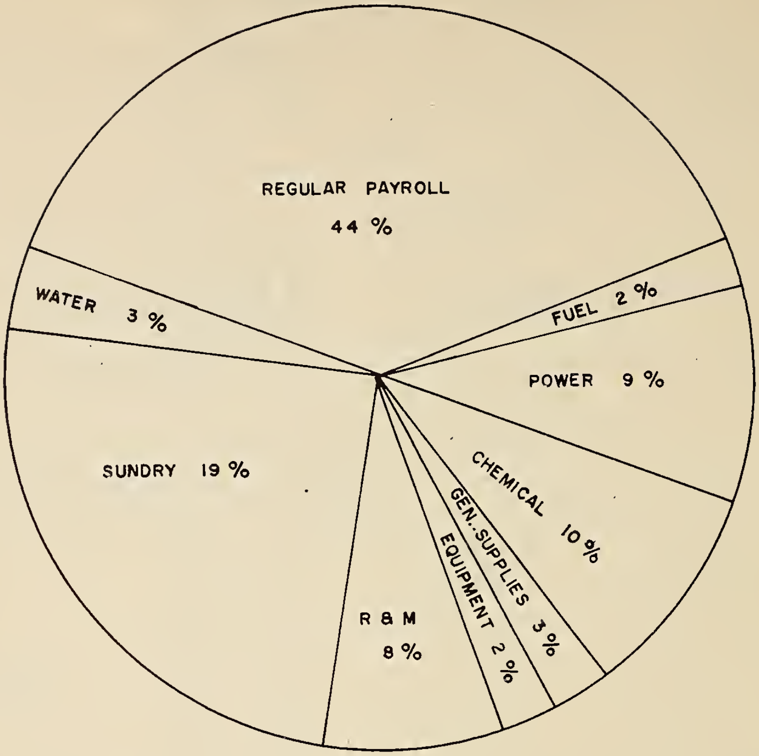
MONTH	TOTAL EXPENDITURE	PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	2,679.17	1458.86	53.40		1029.00	87.61		33.37	13.60	3.33
FEB	2,746.87	1458.86		603.58		46.64		14.61	19.60	603.58
MARCH	4,161.75	2544.78	249.20	178.68		101.06	271.81	76.29	944.29	(204.36)
APRIL	2,907.69	1572.58	53.40	411.85		62.71	55.29	88.80	444.72	218.34
MAY	2,971.62	1717.18	124.60	509.15	120.00	51.76	32.38	71.88	104.02	240.65
JUNE	4,441.21	1586.35	71.20	429.31	1350.00	63.02	204.75	20.56	466.25	249.77
JULY	3,835.73	1588.86		447.40		92.64		5.23	1528.78	172.82
AUG	2,308.16	1604.65		376.29		138.06		47.50	31.10	110.56
SEPT	4,828.16	2477.50		380.25		118.77		631.93	1125.75	93.96
OCT	3,765.11	1588.09	67.77	356.22		132.06		1090.15	440.63	90.19
NOV	8,059.29	1814.23		456.93	2131.50	144.55		939.27	2471.15	101.66
DEC	5,950.93	1893.24	286.58	413.10		166.58	488.05	784.50	1819.25	99.63
TOTAL	48,655.69	21305.18	906.15	4562.76	4630.50	1205.46	1052.28	3804.09	9409.14	1780.13

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $7,045.11
BRACKETS INDICATE CREDIT

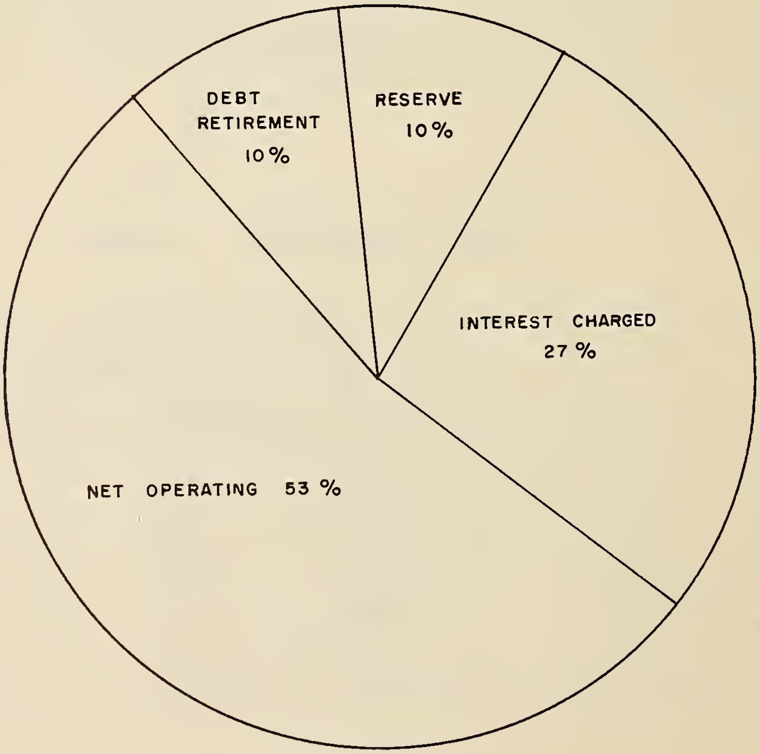
YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1963	1164.493	$25012.46	$21.50	1½ CENTS
1964	1147.207	27331.80	23.82	3 CENTS
1965	1236.31	34109.32	27.59	6 CENTS
1966	1166.20	36736.62	31.52	6 CENTS
1967	1415.50	48655.69	34.37	3 CENTS

1967 OPERATING COSTS



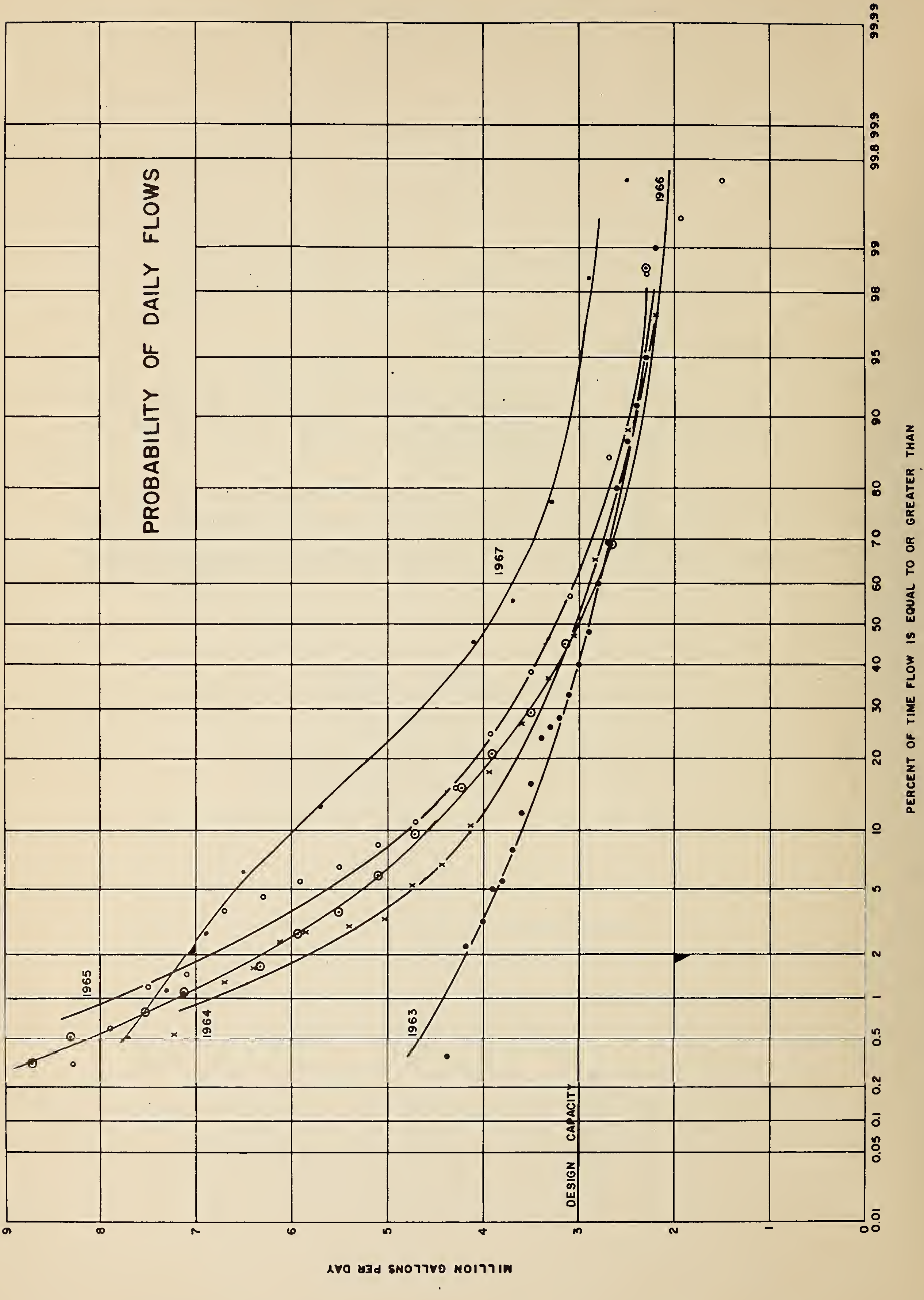
TOTAL ANNUAL COST

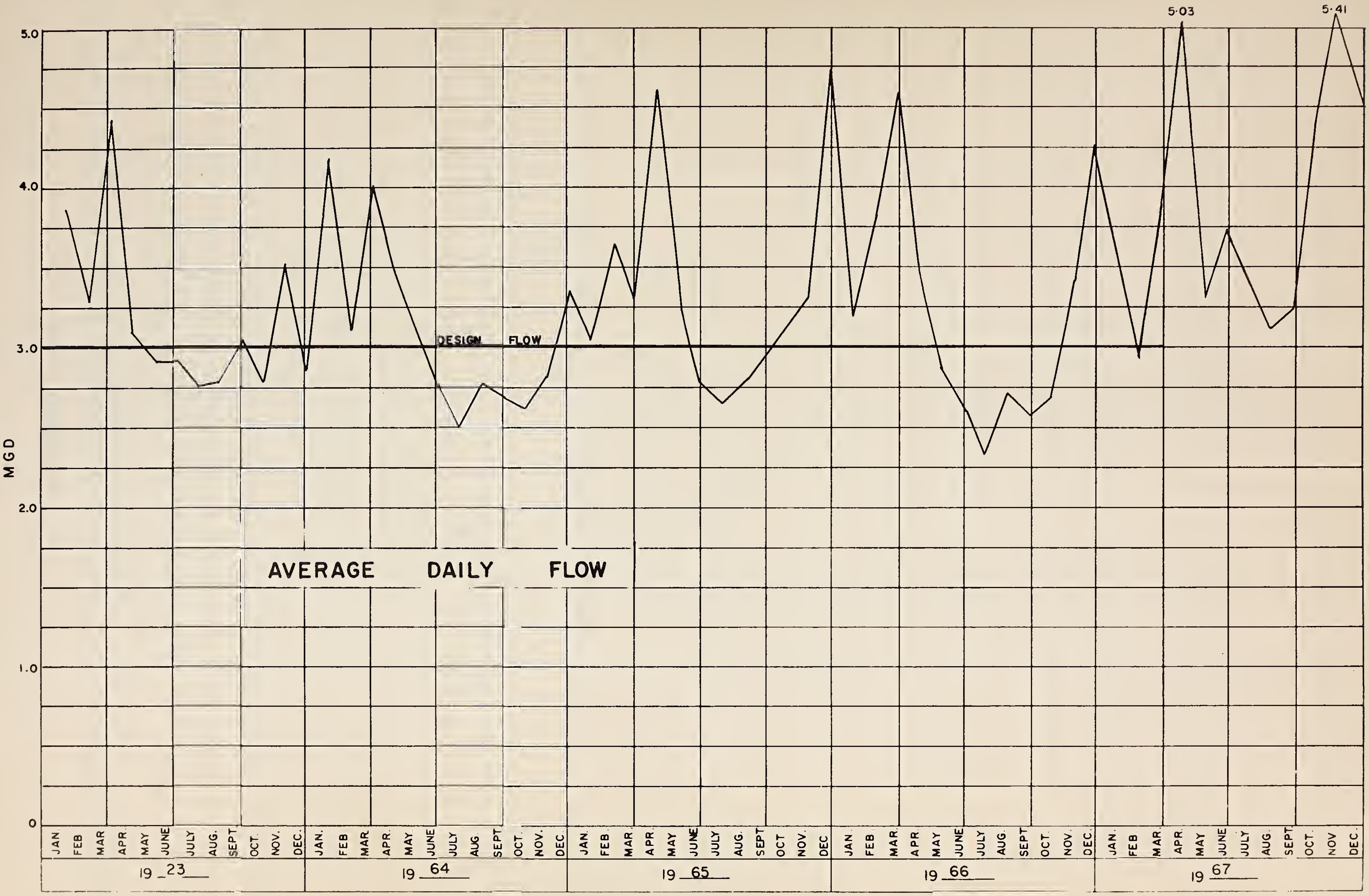


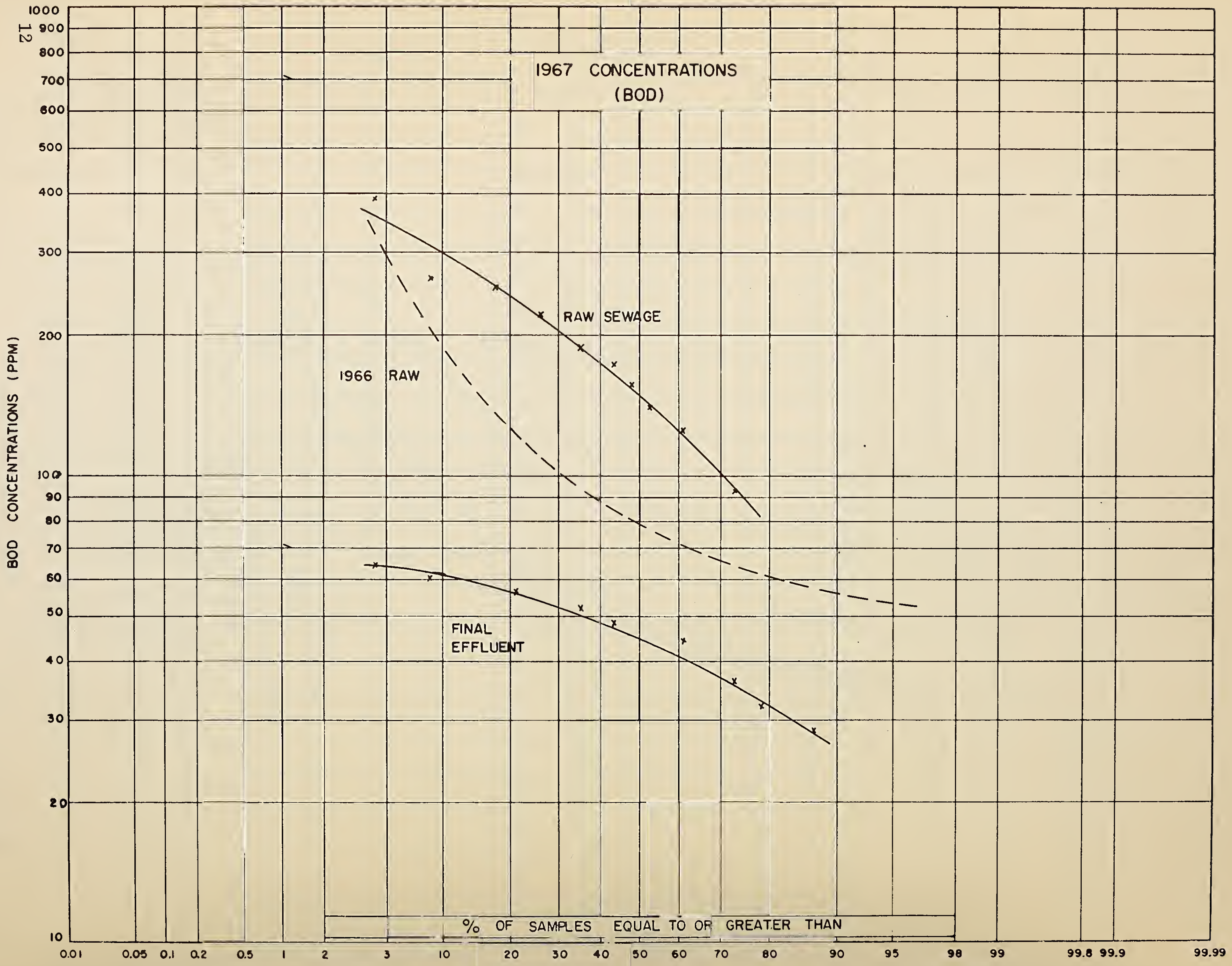
Process Data

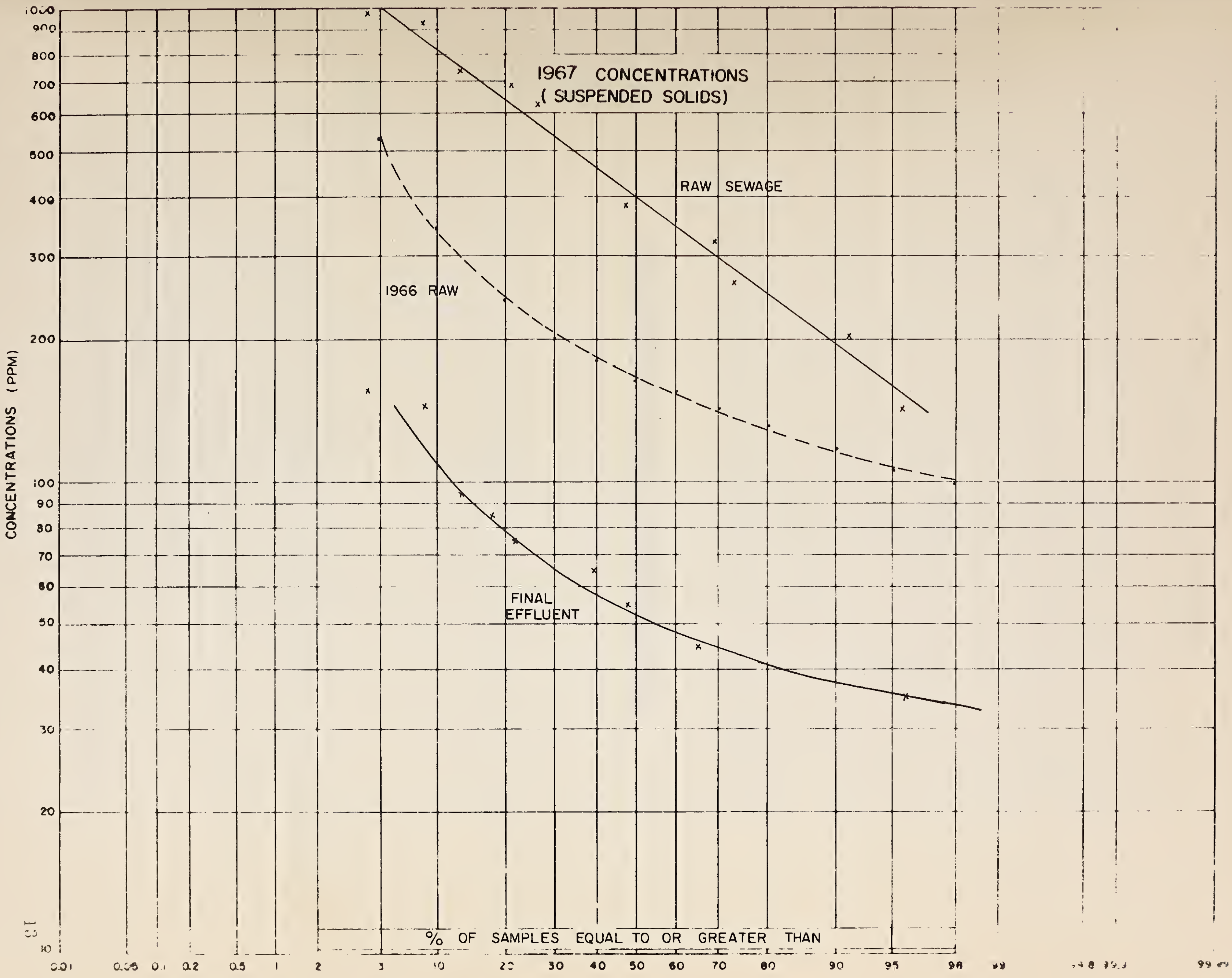
A plot of daily flow probability indicates that the plant was overloaded 94% of the time. This represents a substantial increase over 1966 when the plant was overloaded 50% of the time.

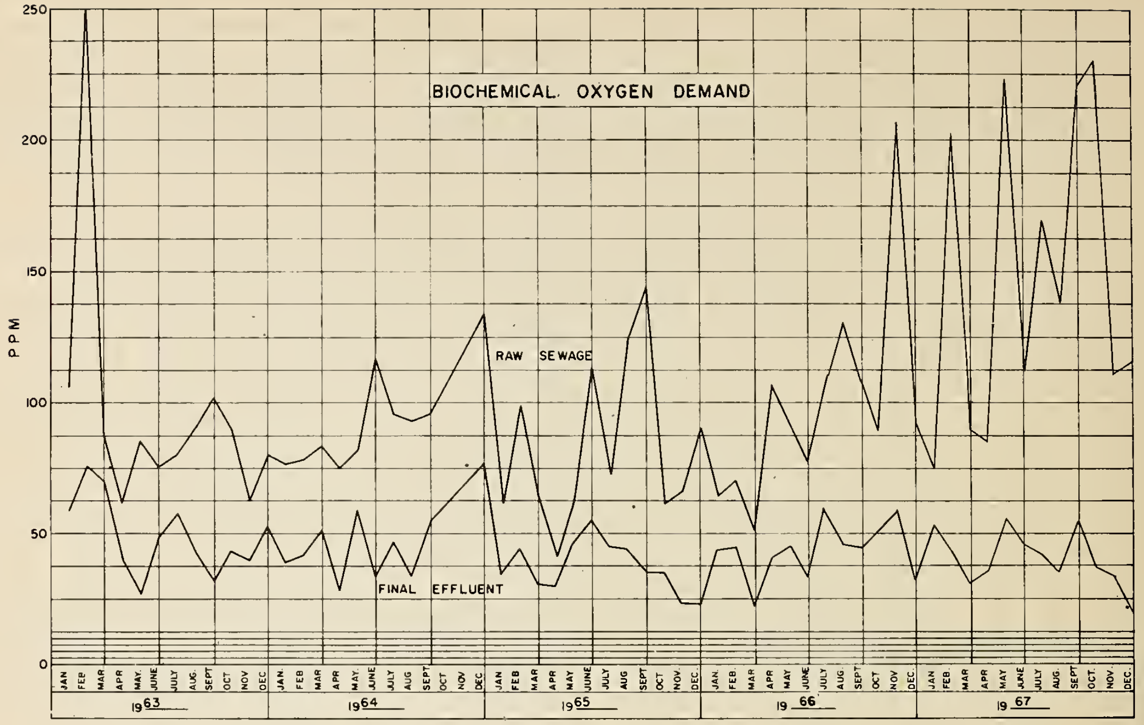
The prime contributing factor is the failure of the storm-water release system on the West Side interceptor system due to the high lake levels. This has increased flows to the plant from the West Side sewage pumping station. Temporary Diesel pumping was installed at this station pending the preparation of a proposal for a permanent increase in pumping capacity.


PROBABILITY OF DAILY FLOWS
1963
1964
1965
1966
1967
DESIGN CAPACITY
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
MILLION GALLONS PER DAY
0
1
2
3
4
5
6
7
8
9

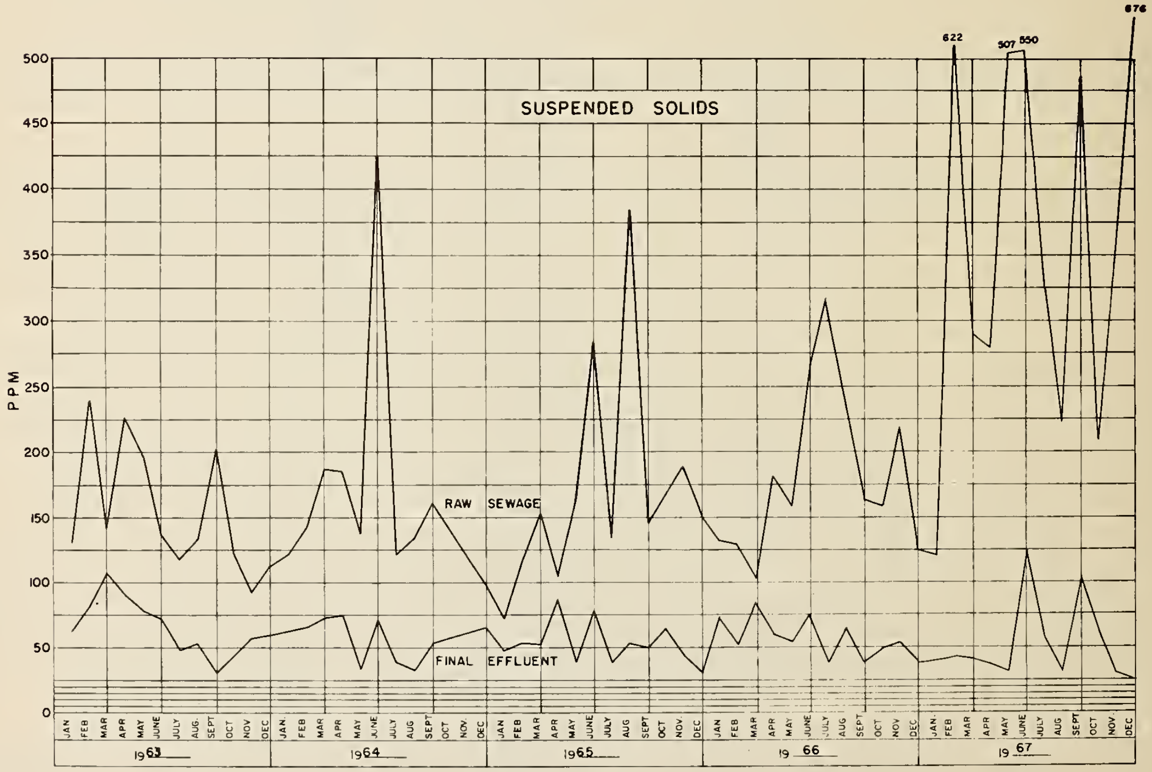

5·03
5·41
5.0
4.0
3.0
2.0
1.0
0
MGD
DESIGN FLOW
AVERAGE DAILY FLOW
JAN
FEB
MAR
APR.
MAY
JUNE
JULY
AUG.
SEPT
OCT.
NOV.
DEC.
19 23
19 64
19 65
19 66
19 67


1967 CONCENTRATIONS
(BOD)
RAW SEWAGE
1966 RAW
FINAL
EFFLUENT
BOD CONCENTRATIONS (PPM)
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
% OF SAMPLES EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99


1967 CONCENTRATIONS
(SUSPENDED SOLIDS)
RAW SEWAGE
1966 RAW
FINAL
EFFLUENT
CONCENTRATIONS (PPM)
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
% OF SAMPLES EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	74	53	28.4	11.64	119	39	67.2	44.36	82
FEB.	203	43	78.8	65.00	622	42	93.3	233.80	49
MAR.	90	31	65.6	35.31	290	40	86.2	149.62	112
APR.	84	36	57.1	36.22	279	37	86.7	182.59	125
MAY	224	56	75.0	86.10	507	31	93.9	243.95	90
JUNE	111	46	58.6	36.37	550	123	77.6	238.91	116
JULY	170	42	75.3	67.58	324	57	82.4	140.98	72
AUG.	138	35	74.6	49.44	220	31	85.9	90.72	93
SEPT.	220	54	75.4	80.34	486	103	78.8	185.37	67
OCT.	231	37	84.0	131.14	209	62	70.3	99.37	115
NOV.	111	33	70.3	63.34	372	30	91.9	277.70	167
DEC.	115	21	81.7	66.88	676	24	96.4	463.90	73
TOTAL	-	-	-	729.36	-	-	-	2351.27	1161
AVG.	148	41	62.4	60.78	388	52	81.7	195.94	97

COMMENTS

The strength of the raw sewage increased substantially in 1967. However, this increase was accompanied by a corresponding increase in treatment efficiency so that effluent strength remained relatively unchanged from 1966.

There are three factors which have contributed to the increase in raw sewage strength:

(a) An increase in industrial connections to the system,
(b) The sewer flushing effect of periodic high flows,
(c) An improvement in sampling technique.

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS		
	GALLONS	% SOLIDS	% VOL MAT	GALLONS	% SOLIDS	% VOL. MAT
JAN	248,000	6.7	62.8	91,800	9.3	28.7
FEB	224,000	4.9	72.1	60,000	6.6	32.2
MAR.	248,000	6.4	53.5	170,500	7.6	32.9
APR.	240,000	9.5	29.5	50,400	7.4	27.6
MAY	242,000	4.6	50.1	45,300	10.1	24.8
JUNE	240,000	9.8	49.6	112,200	10.1	23.0
JULY	248,000	9.3	44.2	85,200	10.0	26.0
AUG.	248,000	8.9	42.1	224,400	5.4	-
SEPT.	240,000	8.8	50.1	62,400	4.7	20.0
OCT.	248,000	7.6	54.5	240,600	-	-
NOV.	240,000	7.8	47.4	277,900	-	-
DEC.	248,000	5.8	51.0	234,000	-	-
TOTAL	2914,000	-	-	1654,700	-	-
AVG.	242,833	7.5	50.6	137,892	7.9	26.9

COMMENTS

During the last eight months of 1967 the secondary digester was removed from service so that the accumulated grit could be removed.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (P.P.M)
JANUARY	110. 90	3175	2. 86
FEBRUARY	81. 30	2685	3. 30
MARCH	119. 70	3955	3. 30
APRIL	150. 90	4043	2. 68
MAY	102. 50	2750	2. 68
JUNE	111. 90	3210	2. 87
JULY	105. 60	2885	2. 73
AUGUST	96. 00	2991	3. 12
SEPTEMBER	96. 80	2675	2. 76
OCTOBER	135. 20	3390	2. 51
NOVEMBER	162. 40	3975	2. 45
DECEMBER	142. 30	3415	2. 40
TOTAL	1415. 50	39149	-
AVERAGE	117. 96	3262	2. 81

COMMENTS

The plant effluent was chlorinated on a year-round basis because the municipality draws its raw water from the Sound.

An average dosage of 2. 81 ppm produced the required chlorine residual of 0. 5 ppm.

Date Due

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS

OPERATING SUMMARY 1967 -
OWEN SOUND WATER POLLUNTION
CONTROL PLANT.

DATE	ISSUED TO #1.

CONCLUSIONS

In 1967 the plant was overloaded both hydraulically and organically.

The hydraulic overload was due primarily to the increased pumpages, from the West Side pumping station while the organic overload was due to a combination of industrial wastes and combined sewers.

RECOMMENDATIONS

The city should increase the program for storm water separation especially on the west side of the city. Consideration should be given to the expansion of treatment facilities before the need for such facilities becomes critical.

ONTARIO WATER RESOURCES COMMISSION